

NOTES ON THE LIFE HISTORY OF THE WESTERN AUSTRALIAN
SKIPPER *MESODINA HAYI* EDWARDS & GRAHAM
(LEPIDOPTERA: HESPERIIDAE)

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Abstract

The life history of the endemic Western Australian skipper *Mesodina hayi* Edwards & Graham is described, illustrated and compared to other members of the genus. The foodplant is *Patersonia drummondii* (F. Muell.) Benth. (Iridaceae). Two new localities for *M. hayi* are recorded.

Introduction

Mesodina hayi was described only recently (Edwards and Graham 1995). Larvae of other members of the genus all feed on species of *Patersonia* (Iridaceae) (Common and Waterhouse 1981, Edwards 1987). Initial searches therefore were made for suitable foodplants of *M. hayi* on Nature Reserve 16405, near Quairading, the only known locality. In October 1994 a number of mature larvae and pupae were found on *P. drummondii* plants growing in light coloured loamy sand on a well drained gentle slope. The site was dominated by *Allocasuarina campestris* shrubland with *Dryandra*, *Beaufortia* and *Verticordia* shrubs forming a component of the association. Further visits were made to the site in 1995 so that progress of oviposition sites and larval development could be documented.

Life history

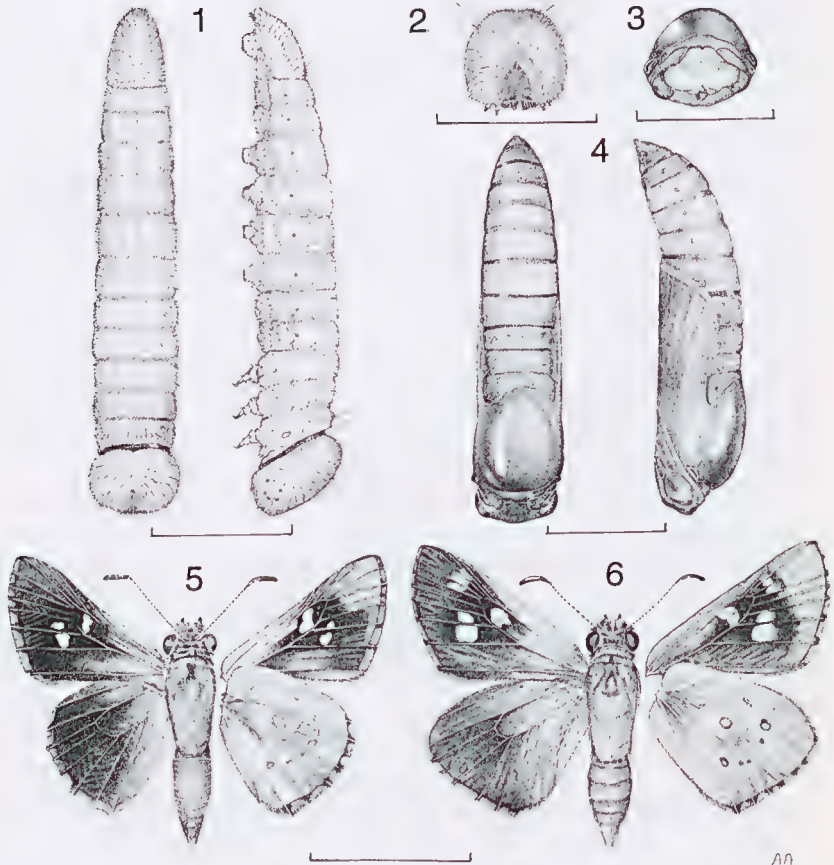
Foodplant: *Patersonia drummondii* (Drummond's Flag Lily) (Iridaceae).

Egg (Fig. 11). Diameter 1.3 mm, hemispherical, uniformly pale green in colour; surface with 68-74 fine vertical ribs, broken near micropyle. Translateral striations or cross ribs between vertical ribs very fine, more prominent on dorsal surface.

First instar larva (Fig. 12). Length 3.5-4.5 mm, head shining black, finely pitted and with sparse long whitish setae; prothoracic plate shining black with a few short setae; collar between head and prothoracic plate pale pink. Body tapered, front portion yellowish green, rear half becoming more yellowish. Body covered with a few short clubbed setae, posterior end with sparse long whitish setae.

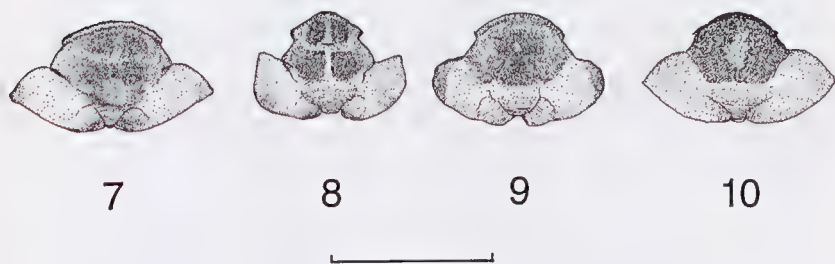
Third to final instar larvae (Fig. 1). Length 13-20 mm; head (Fig. 2) large and rounded, pale greyish green in colour, surface slightly roughened and covered with numerous long blackish setae. Each of these protrudes from a black spot which gives the head a speckled appearance. Body greenish, with sparse short club-like setae. Posterior end with long pale setae. The intersegmental membranes are yellowish and contrast with the green body colour, though in full sized larvae this contrast may be less pronounced. A

very distinct narrow black dorsal line extends almost the length of the body. The mature larva is sparsely covered with white waxy powder.

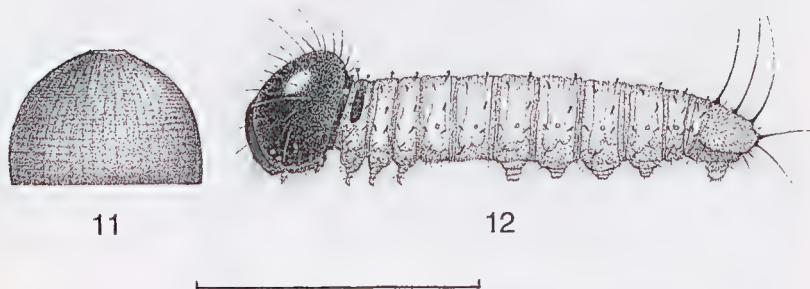


Figs 1-6. Juvenile stages and adults of *M. hayi* from Quairading, WA. (1) final instar larva, dorsal and lateral view; (2) final instar larval head; (3) frons of pupa; (4) pupa, dorsal and lateral view; (5) adult male, upperside and underside; (6) adult female, upperside and underside. Scale bars: (1-4) = 5 mm; (5, 6) = 10 mm.

Pupa (Fig. 4). Length 15-17 mm, moderately broad anterior tapering to posterior with small cremaster. Frons (Fig. 3) more or less smooth, with a small moderately sclerotized operculum. Colour somewhat variable, fresh pupae with head, thorax and wing cases dull green, abdomen yellowish. Some specimens have a blackish head and dorsal thoracic area. As pupae develop they darken; just prior to emergence the pupal cap (Fig. 8) is black, the thorax and wing cases brownish black and the abdomen dark yellowish brown. The edges of the abdominal segments remain yellowish giving it a banded appearance.



Figs 7-10. *Mesodina* pupal caps. (7) *M. cyanophracta*, Perth, WA; (8) *M. hayi*, Quairading, WA; (9) *M. halyzia*, Isla Gorge, Qld; (10) *M. aeluropis*, Blue Mts, NSW. Scale bar = 5 mm.



Figs 11-12. Juvenile stages of *M. hayi* from Quairading, WA. (11) egg; (12) first instar larva. Scale bar = 2 mm.

Discussion

There appears to be only one generation annually. At Quairading adult *M. hayi* emerge during October and November. Eggs are laid singly on the underside of the leaves of the foodplant. The emerging larvae make small shelters by silking together two adjacent leaves and start feeding at the tips of the leaves above these shelters. Larger larvae construct tent-like shelters by silking together five to eight leaves of the foodplant. These are open at the bottom and lined with silk. Though smaller in size, they are similar to shelters of *Mesodina cyanophracta* Lower which are found on the more robust *P. occidentalis* (Williams and Atkins 1996). *M. hayi* may also produce characteristic wedge-shaped feeding scars similar to those made by the larvae of *M. cyanophracta*. However, the narrow leaves of *P. drummondii* often mean that the depth of the cuts results in the upper portion of the leaf falling away leaving the leaf cut off at an oblique angle. Larvae usually return to this exposed surface on subsequent feeding forays. They often construct silken tightropes from the base of the leaves below their shelters to their feeding sites, habitually using these pathways when travelling to and from their shelters. Captive larvae have been observed feeding during the late afternoon (R.W. Hay, *pers. comm.*). They seldom feed for longer than 10 or 15 minutes before returning to their shelters. After rain, larvae have been observed imbibing moisture off the surface of the leaves. In common with other species of *Mesodina* Meyrick, larvae of *M. hayi* rest head downwards within their shelters and before pupation seal the entrance with a paper-like layer of silk.

There are marked differences between the eggs, larvae and pupae of *M. hayi* and those of *M. cyanophracta*. The eggs of *M. hayi* are uniform in colour and lack the characteristic maroon dorsal blotch found in eggs of *M. cyanophracta*. In first instar larvae of *M. hayi*, the collar between head and prothoracic plate is pale pink, whereas in *M. cyanophracta* this collar is bright orange-red. Mature larvae of *M. hayi* are greenish, similar to those of *M. halyzia* (Hewitson) (Common and Waterhouse 1981), whereas *M. cyanophracta* larvae are greyish-brown in colour (Williams and Atkins 1996). In pupae of *M. hayi*, the operculum is less ovoid with higher dorsal extension and upturned lateral (eye) sections, whereas in *M. cyanophracta* the operculum is elliptical and pointed laterally. The pupal cap of *M. hayi* also has more definite divided sclerotized areas. Figs 7-10 show differences between the pupal caps of *M. cyanophracta*, *M. hayi*, *M. halyzia* and *M. aeluropis* Meyrick.

The wing shape of *M. hayi* and pupal operculum suggest that it is structurally close to the genera *Croitana* Waterhouse and *Proeidosia* Atkins; however the adult maculation, *Patersonia* foodplant, larval and pupal characters clearly belong to *Mesodina*. Edwards and Graham (1995) also noted that the male and female genitalia have all the attributes of *Mesodina*, and none of those of *Croitana*. The operculum of this species also shows a closer affinity with *M.*

aeluropis from eastern Australia rather than *M. cyanophracta* from Western Australia.

Searches for other populations of *M. hayi* in the Western Australian wheatbelt have so far been unsuccessful. The small grey-green leafed form of *P. drummondii* has been recorded from wheatbelt sites near Quairading, Tammin, Bruce Rock and Wyalkatchem. However, it is likely that many of the localities where Herbarium material was originally collected have been cleared for farming.

To the north, two much larger forms of *P. drummondii* are known to occur (G. Keighery, *pers. comm.*). Examination of plants growing alongside the North West Coastal Highway 56 km north of the Murchison River Bridge (27°21'01"S, 114°37'26"E), and at Kalbarri National Park (27°42'59"S, 114°19'13"E) in September 1995, confirmed the presence of *M. hayi* populations at both localities. Interestingly, specimens of *M. cyanophracta* have also been taken near Kalbarri (Edwards and Graham 1995), and we found *M. cyanophracta* pupae on isolated clumps of *P. occidentalis* within 10 metres of *M. hayi* larvae on *P. drummondii*. This confirms that *M. cyanophracta* and *M. hayi* are sympatric. Further surveys are planned to establish whether *M. hayi* utilizes *P. drummondii* elsewhere.

Voucher specimens are lodged in the Insect Collection of the Western Australian Department of Conservation and Land Management and in the Andrew Atkins private collection.

Acknowledgments

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